

| S.# | Question                                                                                                                                                                                                                                                                                                                                                                                                                    | Answer Option (A)                                  | Answer Option (B)                             | Answer Option (C)                         | Answer Option (D)                   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------|-------------------------------------------|-------------------------------------|
| 1   | The unit of velocity is:...                                                                                                                                                                                                                                                                                                                                                                                                 | m                                                  | m s                                           | m / s                                     | m / s^2                             |
| 2   | We can calculate velocity of an object from displacement-time graph by:...                                                                                                                                                                                                                                                                                                                                                  | calculating area under the graph                   | finding gradient of displacement-time graph   | calculating area above the graph          | finding the length of the graph     |
| 3   | If a car is travelling towards east and slowing down, what is the direction of acceleration?                                                                                                                                                                                                                                                                                                                                | towards east                                       | towards west                                  | neither east nor west                     | we can not answer with this data    |
| 4   | Displacement of sun with respect to earth is                                                                                                                                                                                                                                                                                                                                                                                | r                                                  | 2 $\pi$ r                                     | 2r                                        | r^2                                 |
| 5   | If the velocity of particle is varying linearly with time then shape of d-t curve would be                                                                                                                                                                                                                                                                                                                                  | linear                                             | quadratic                                     | cubic                                     | decreasing linearly                 |
| 6   | Work is a                                                                                                                                                                                                                                                                                                                                                                                                                   | vector quantity                                    | scalar quantity                               | sometime scalar some time vector          | none of these                       |
| 7   | A particle of mass 'm' is projected from the ground with an initial speed $u_0$ at an angle 'a' with the horizontal. At the highest point of its trajectory it makes a completely inelastic collision with another particle of mass which was thrown vertically upward from the ground with the same initial speed $u_0$ . The angle that the composite system makes with the horizontal immediately after the collision is | 37°                                                | 45°-a                                         | 45°+a                                     | 90°                                 |
| 8   | If momentum is increased by 20% then K.E. increases by :                                                                                                                                                                                                                                                                                                                                                                    | 0.44                                               | 0.55                                          | 0.66                                      | 0.77                                |
| 9   | Two springs having force constant of 3 : 4, both the springs are stretched by equal force, if elongation in first spring is x then elongation in second spring is                                                                                                                                                                                                                                                           | 3x                                                 | 4x                                            | 3*x/4                                     | 4*x/3                               |
| 10  | Potential energy of the particle of mass 0.5 kg moving along x axis is given by $U = 2^x(x-3)$ , the speed of particle is maximum at                                                                                                                                                                                                                                                                                        | 1 m                                                | 1.5 m                                         | 2 m                                       | 3 m                                 |
| 11  | A body performing circular motion with a constant speed has a constant :                                                                                                                                                                                                                                                                                                                                                    | momentum                                           | angular velocity                              | acceleration                              | radius vector                       |
| 12  | A car is moving in a circular track of radius 20m at a constant speed of 20m/sec. Find the centripetal acceleration?                                                                                                                                                                                                                                                                                                        | 20 m/s^2                                           | 40 m/s^2                                      | 30 m/s^2                                  | 10 m/s^2                            |
| 13  | If an object is undergoing an orbital motion around another object it is called                                                                                                                                                                                                                                                                                                                                             | Revolution                                         | Rotation                                      | Both of them                              | None of them                        |
| 14  | Angle between radius vector and centripetal acceleration is                                                                                                                                                                                                                                                                                                                                                                 | 0°                                                 | $\pi$                                         | 2 $\pi$                                   | none of these                       |
| 15  | If angular velocity increases the _____ also increases                                                                                                                                                                                                                                                                                                                                                                      | time period                                        | frequency                                     | vibration                                 | none of these                       |
| 16  | The object oscillates due to:                                                                                                                                                                                                                                                                                                                                                                                               | a restoring force                                  | its weight                                    | centripetal force                         | force of friction                   |
| 17  | 20 waves pass through a point in a medium, in 5 seconds. What is the time required to pass one wave?                                                                                                                                                                                                                                                                                                                        | 1/4 sec                                            | 4 sec                                         | 1/2 sec                                   | 2 sec                               |
| 18  | Frequency of a travelling wave is 2000 Hz. Its speed is 300m/s. What is its wavelength?                                                                                                                                                                                                                                                                                                                                     | 20/3 m                                             | 20x3 m                                        | 3/20 m                                    | 2/3 m                               |
| 19  | If $f_1$ and $f_2$ are frequencies of two tuning forks, such that $f_1 < f_2$ , then number of beats produced in one second are:                                                                                                                                                                                                                                                                                            | $f_2 - f_1$                                        | $f_2 \times f_1$                              | $f_1 - f_2$                               | $f_2 + f_1$                         |
| 20  | A steel wire hangs vertically from a fixed point, supporting a weight of 80 N at its lower end. The diameter of the wire is 0.50 mm and its length from the fixed point to the weight is 1.5 m. If density of steel wire = $7.8 \times 10^3$ kg/m <sup>3</sup> , then what is the fundamental frequency emitted from the wire.                                                                                              | 76 Hz                                              | 176 Hz                                        | 50 Hz                                     | 150 Hz                              |
| 21  | Under which conditions, a real gas approximate to an ideal gas?                                                                                                                                                                                                                                                                                                                                                             | pressure = high<br>density = high                  | pressure = low<br>density = high              | pressure = high<br>density = low          | pressure = low<br>density = low     |
| 22  | A liquid has specific heat capacity $c$ . The rate of change in temperature of liquid is $R$ . The rate at which heat is transferred from the liquid is $P$ . What is the mass of the liquid?                                                                                                                                                                                                                               | $P/cR$                                             | $PR/c$                                        | $Pc/R$                                    | $cPR$                               |
| 23  | The increase in temperature of the object is an indication of:                                                                                                                                                                                                                                                                                                                                                              | decrease in the internal energy                    | increase in the internal energy               | increase in the potential energy only     | decrease in the kinetic energy only |
| 24  | Molar mass of water is                                                                                                                                                                                                                                                                                                                                                                                                      | 0.018 kg/mol                                       | 0.108 kg/mol                                  | 0.027 kg/mol                              | 0.0635 kg/mol                       |
| 25  | If two point charges of charge $q_1$ and $q_2$ are placed at distance $d$ . The force between them is proportional to:...                                                                                                                                                                                                                                                                                                   | d                                                  | $d^2$                                         | 1/d                                       | $1/d^2$                             |
| 26  | A charge is moving with velocity $v$ , it enters a uniform electric field $E$ . The direction of $v$ and $E$ are not parallel. What is the path of the charge particle inside the electric field?                                                                                                                                                                                                                           | parabolic                                          | circular                                      | parallel to $v$                           | parallel to $E$                     |
| 27  | Two equal, opposite charges are fixed at a distance $d$ . Positive charge is at the right and negative at the left position. As shown below:<br><div style="display: flex; justify-content: space-around; width: 100px;"> <span>X</span> <span>Y</span> <span>Z</span> </div> At which position, the net electric field is directed to the left?                                                                            | X, Y and Z                                         | X only                                        | X and Z only                              | Y only                              |
| 28  | Two charges of -2 $\mu$ C and +4 $\mu$ C are a fixed distance apart. As shown below:<br><div style="display: flex; justify-content: space-around; width: 100px;"> <span>A</span> <span>+4<math>\mu</math>C</span> <span>B</span> <span>-2<math>\mu</math>C</span> <span>C</span> </div> At which position can the electric field be zero?                                                                                   | at A only                                          | at B only                                     | at C only                                 | at A, B and C                       |
| 29  | Ohm's Law is applicable only when temperature remains                                                                                                                                                                                                                                                                                                                                                                       | changing                                           | absolute zero                                 | constant                                  | None of these                       |
| 30  | Terminal potential difference of a cell                                                                                                                                                                                                                                                                                                                                                                                     | increases with increase in its internal resistance | decrease with increase in internal resistance | is independent of its internal resistance | None of these                       |
| 31  | Electrical power of a battery is defined as the rate of                                                                                                                                                                                                                                                                                                                                                                     | Supply of electrical energy by battery             | production of electrical energy of a battery  | both                                      | none of these                       |
| 32  | Electrical power is given by $P =$                                                                                                                                                                                                                                                                                                                                                                                          | $VI$                                               | $I^2 R$                                       | $V^2 / R$                                 | all                                 |
| 33  | $\cos \phi = \Phi /$                                                                                                                                                                                                                                                                                                                                                                                                        | BA                                                 | A                                             | B                                         | $B^2$                               |
| 34  | A charge of 1 $\mu$ C is moving antiparallel to magnetic lines of force, then the magnetic force acting on charge is                                                                                                                                                                                                                                                                                                        | 0                                                  | $vB$                                          | $vB \sin \phi$                            | $qvB$                               |
| 35  | Find the magnetic flux density when a flux of 28 units is enclosed in an area of 15cm.                                                                                                                                                                                                                                                                                                                                      | 178.33 units                                       | 186.67 units                                  | 192.77 units                              | 200 units                           |
| 36  | Lorentz force in electric and magnetic field is                                                                                                                                                                                                                                                                                                                                                                             | $F = qv[E+B]$                                      | $qE[v+B]$                                     | $qvB$                                     | $q[E+vB]$                           |
| 37  | The principle of a direct current generator is based on                                                                                                                                                                                                                                                                                                                                                                     | Coulomb's Law                                      | Ampere's Law                                  | Faraday's Law                             | Lenz's Law                          |
| 38  | Which of the following is the unit of mutual inductance?                                                                                                                                                                                                                                                                                                                                                                    | $VsA^{-2}$                                         | $V^{-3}As^2$                                  | $V^2 s$                                   | $VsA^{-1}$                          |
| 39  | The maximum instantaneous value measured from zero value is known as?                                                                                                                                                                                                                                                                                                                                                       | peak value                                         | peak to peak value                            | cycle                                     | period                              |
| 40  | Which of the following remains unchanged in transformer                                                                                                                                                                                                                                                                                                                                                                     | Voltage                                            | current                                       | Power                                     | Capacitance                         |
| 41  | The number of diodes in bridge rectifier is                                                                                                                                                                                                                                                                                                                                                                                 | 4                                                  | 3                                             | 2                                         | 5                                   |
| 42  | what is the range of typical band gap in conductors                                                                                                                                                                                                                                                                                                                                                                         | 100-1000eV                                         | 0.5-10eV                                      | 0.01-0.1 eV                               | 10000-10000000eV                    |
| 43  | Voltage after which in forward bias current start to rise with increase in voltage is called                                                                                                                                                                                                                                                                                                                                | breakdown voltage                                  | reverse voltage                               | forward voltage                           | knee voltage                        |
| 44  | A half wave rectifier is operating from 50 Hz mains, fundamental frequency of ripple will be                                                                                                                                                                                                                                                                                                                                | 100 Hz                                             | 25 Hz                                         | 200Hz                                     | 50Hz                                |
| 45  | Calculate the energy of a photon of wavelength 6600 angstroms.                                                                                                                                                                                                                                                                                                                                                              | $0.3 \times 10^{-19}J$                             | $3 \times 10^{-19}J$                          | $30 \times 10^{-19}J$                     | $300 \times 10^{-19}J$              |
| 46  | A hydrogen atom in its ground state absorbs 10.2 eV of energy. What is the orbital angular momentum is increased by?                                                                                                                                                                                                                                                                                                        | $4.22 \times 10^{-34} Js$                          | $2.11 \times 10^{-34} Js$                     | $3.16 \times 10^{-34} Js$                 | $1.05 \times 10^{-34} Js$           |
| 47  | Plank's constant is analogous to :                                                                                                                                                                                                                                                                                                                                                                                          | Inertia                                            | Wave nature                                   | Angular momentum                          | Liner momentum                      |
| 48  | x-rays are used to investigate                                                                                                                                                                                                                                                                                                                                                                                              | crystals                                           | molecules                                     | ions                                      | electrons                           |
| 49  | If the ionization energy of hydrogen atom is 13.6 eV, its ionization potential will be                                                                                                                                                                                                                                                                                                                                      | 13.6 eV                                            | 136.0 eV                                      | 3.4 eV                                    | none of these                       |
| 50  | The number of protons in the nucleus is called _____ number                                                                                                                                                                                                                                                                                                                                                                 | atomic                                             | charge                                        | atomic or charge                          | neither atomic nor charge           |
| 51  | The existence of positron was discovered in the                                                                                                                                                                                                                                                                                                                                                                             | thermal radiation                                  | cosmic radiation                              | electromagnetic radiation                 | non-electromagnetic radiation       |
| 52  | Which of the following substances cannot be emitted by radioactive substances during their decay?                                                                                                                                                                                                                                                                                                                           | proton                                             | neutrinos                                     | helium nuclei                             | electrons                           |

|    |                                                                                                     |                     |                     |                       |                       |
|----|-----------------------------------------------------------------------------------------------------|---------------------|---------------------|-----------------------|-----------------------|
| 53 | Spectral lines is like a _____ of absorbed or emission energy in a spectrum                         | charged pattern     | fingerprint pattern | discharged pattern    | None of these         |
| 54 | Lifetime of an excited state is                                                                     | $10^{(-6)}\text{s}$ | $10^{(-7)}\text{s}$ | $10^{(-8)}\text{s}$   | $10^{(-3)}\text{s}$   |
| 55 | Energy difference in balmer series for longest wavelength is                                        | 1.89 eV             | 2.9eV               | 5.6eV                 | 7.8 eV                |
| 56 | Consider the wavelength corresponding to $n=2$ to $n=1$ in hydrogen atom the shortest wavelength is | Hydrogen atom       | deutirium           | signly ionised helium | doubly ionised helium |